

A REVIEW OF THE BAT FLEA GENUS *HORMOPSYLLA*
(SIPHONAPTERA: ISCHNOPSYLLIDAE)

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Abstract.—*Hormopsylla trux* Jordan, 1950 is reported for the first time in Venezuela. *Hormopsylla cryptica* Tipton and Machado-Allison, 1972 is a **new junior synonym** of *H. fosteri* (Rothschild, 1903). A key is provided to distinguish the four recognized species of the bat flea genus *Hormopsylla*.

Key Words: Siphonaptera, bat fleas, *Hormopsylla*, Ischnopsyllidae

A monograph of Ischnopsyllidae by Hopkins and Rothschild (1956) provides distributional records and host/parasite data for three species of *Hormopsylla*: *H. fosteri* (Rothschild 1903), *H. trux* Jordan, 1950, and *H. egena* Jordan, 1950. Since that publication, two new species have been described, *H. cryptica* Tipton and Machado-Allison, 1972, and *H. kyriophila* Tipton and Mendez, 1966, and additional records were reported for *H. kyriophila* by Smit (1971) and for *H. trux* by Whitaker and Easterla (1975) and Ayala-Barajas et al. (1988). Recently specimens of *H. fosteri* and *H. trux* were collected by R. Guerrero in Venezuela, the latter constituting a new record which warrants reporting. In this paper, we consolidate existing information, add new distributional records, annotate host/parasite data, and provide a key to the four recognized species of *Hormopsylla*.

HOST SYNONYMS

The following chiropteran species preceding various junior synonyms are currently accepted taxa according to Wilson and Reeder (1993). Junior synonyms are

used throughout the text as cited in literature, or as extracted from slide labels. *Desmodus rotundus* (Geoffroy 1810) = *Desmodus rufus* Wied-Neuwied, 1826; *Eumops bonariensis* (Peters 1874) = *Molossus bonariensis* Dobson, 1876; *Molossus molossus* (Pallus 1766) = *Molossus coibensis* Allen, 1904, and *Molossus major* Hershkovitz, 1949; *Nyctinomops laticaudatus* (Geoffroy 1805) = *Nyctinomops gracilis* (sic!) Dobson, 1876, *Nyctinomus laticaudatus* (sic!) Miller, 1902, *Tadarida gracilis* (author unknown), *Tadarida laticaudata* Shamel, 1931, *Tadarida laticaudata yucatanica* Jones and Alvarez, 1962, and *Tadarida yucatanica* (Miller 1902); *Nyctinomops macrotis* (Gray 1840) = *Tadarida macrotis* Miller, 1924, and *Tadarida mollosa* Hershkovitz, 1949.

RESULTS AND DISCUSSION

Species of *Hormopsylla* are restricted to the Neotropical Region with one species reaching the southern Nearctic Region. They prefer bats of the Family Molossidae, although they have been collected from Vespertilionidae [*Eptesicus brasiliensis*

(Desmarest 1819)] and Phyllostomidae [(*D. rotundus* and *Phyllostomus hastatus* (Pallas 1767)]. In general, specimens of *Hormopsylla* are rare in collections, but more attention to collecting from molossid bats throughout their range (particularly from species of *Eumops* Miller, 1906, *Molossus* Geoffroy, 1805, and *Nyctinomops* Miller, 1902) would undoubtedly extend the distribution of all species of *Hormopsylla*.

Hormopsylla egena Jordan
(Fig. 3)

Hormopsylla egena Jordan 1950: 608, Fig. 5.

Material examined.—PERU: 4 ♀, ex: "bats in rat burrow in roof," Trujillo City, XII-1947, D.A. Macchiavello.

Remarks.—*Hormopsylla egena* is known only from seven females.

Hormopsylla fosteri Rothschild
(Figs. 2, 5, 7)

Hormopsylla fosteri Rothschild 1903: 324, Pl. X, Figs. 23–26.

Hormopsylla cryptica Tipton and Machado-Allison 1972: 87, Figs. 72–74. **New synonymy.**

Material examined.—ARGENTINA: 1 ♀, Tucumán, J. Morgensen; 9 ♂, 9 ♀, ex: *Eumops perotis* (Schinz 1821), embalse Rio Tercero, Cordoba Prov., Dep. Calamuchita, elev. ca. 400 m, 19-IX-1981, S.I. Tiranti (also 10 ♂, 20 ♀, alcohol); 4 ♂, 15 ♀, also in alcohol, *ibid.*, except 19 VIII-1981; BRAZIL: 2 ♀, ex: *D. rotundus*, São Paulo, P. Sawaya; PARAGUAY: ♂ lectotype, ♀ lectoallotype, ♀ paralectotype, ex: *M. bonariensis*, Ascension (sic!), 6-VIII-1900, S. Foster; VENEZUELA: (*Hormopsylla cryptica*), ♂ holotype (USNM No. 72537), ex: *E. brasiliensis*, 84 km sse Esmeralda, near Boca Mavaca, T.F. Amazonas, elev. 185 m, 13-II-1966, Tuttle Team; 1 ♂, 2 ♀, ex: *M. molossus*, Cumbre Cerro Guanay, Edo. Amazonas, elev. 1100 m, 14-II-1995, R. Guerrero; 1 ♂ 1 ♀, *ibid.*, but elev. 1200 m; 2 ♀, ex: *N. laticaudatus*, Tepuy, Guyana

Highlands, Edo. Amazonas, elev. 1200 m, R. Guerrero, 13-II-1995.

Remarks.—The first record of *H. fosteri* in Venezuela was described from three males by Tipton and Machado-Allison (1972) as *H. cryptica*. Each was collected from a different host species (*E. brasiliensis*, *M. molossus*, and *N. laticaudatus*) at low elevations (150–185 meters). In our study, the holotype of *H. cryptica* (USNM No. 72537) could not be distinguished from the lectotype of *H. fosteri*. The characters used by Tipton and Machado-Allison (1972) (shape of the apex of St-VIII, the body of the clasper, the crochets, and median dorsal lobes) to separate these two species do not distinguish them. The shape of these structures is affected by orientation during mounting. The delicate membranous nature of the dorsal median lobe as seen in a dissected male of *H. fosteri* is particularly prone to distortion. Examination of many males demonstrated variation common to both species. Therefore, we propose that *H. cryptica* is a junior synonym of *H. fosteri*. Other records have since been added (see Material Examined: Venezuela above). Previously, *H. fosteri* was reported from *E. bonariensis* and *N. laticaudatus* in Paraguay by Rothschild (1903); from *D. rotundus* and *P. hastatus* in Brazil by Guimarães (1940) and Cunha (1914), respectively; and in Argentina (host unknown) by Hopkins and Rothschild (1956). An additional large series in the collection of Dr. Nixon Wilson is previously unreported (see Material Examined: Argentina, collected by S.I. Tiranti).

Rothschild (1903) did not designate a holotype, although his original description was based on one male and three females. The original description indicates the male was collected from *M. bonariensis*, but was later designated by Hopkins and Rothschild (1956: 214) as the "holotype" collected from *Nyctinomus laticaudatus*. The label of the actual designated lectotype in The Natural History Museum, London, indicates the host as *Molossus bonariensis*.

Hormopsylla kyriophila Tipton and Mendez
(Figs. 1, 6, 8)

Hormopsylla kyriophila Tipton and Mendez 1966: 303, Pl. 60–61.

Material examined.—PANAMA: ♂ holotype, Coll. No. 7583, USNM No. 104641, ex: *Tadarida yucatanica*, (under roof tile on) belfry of Church, Pacora (about 25 miles northeast of Panama City, elev. sea level), 21-VI-1961, (C.M.) Keenan and (V.J.) Tipton; ♀ allotype, *ibid.*, but Coll. No. 7284, 20-VI-1961. Information added from text of original description is indicated in parentheses.

Remarks.—*Hormopsylla kyriophila* was described from Panama from *T. yucatanica* and *M. molossus*. Smit (1971) also reported this flea in Cuba from *Tadarida laticaudata yucatanica* and in Veracruz State, Mexico from *N. laticaudatus*. Although the elevation for the specimens in Cuba are unknown, the other two collections have been at elevations below 100 meters.

Hormopsylla trux Jordan
(Fig. 4)

Hormopsylla trux Jordan 1950: 608, Fig. 5

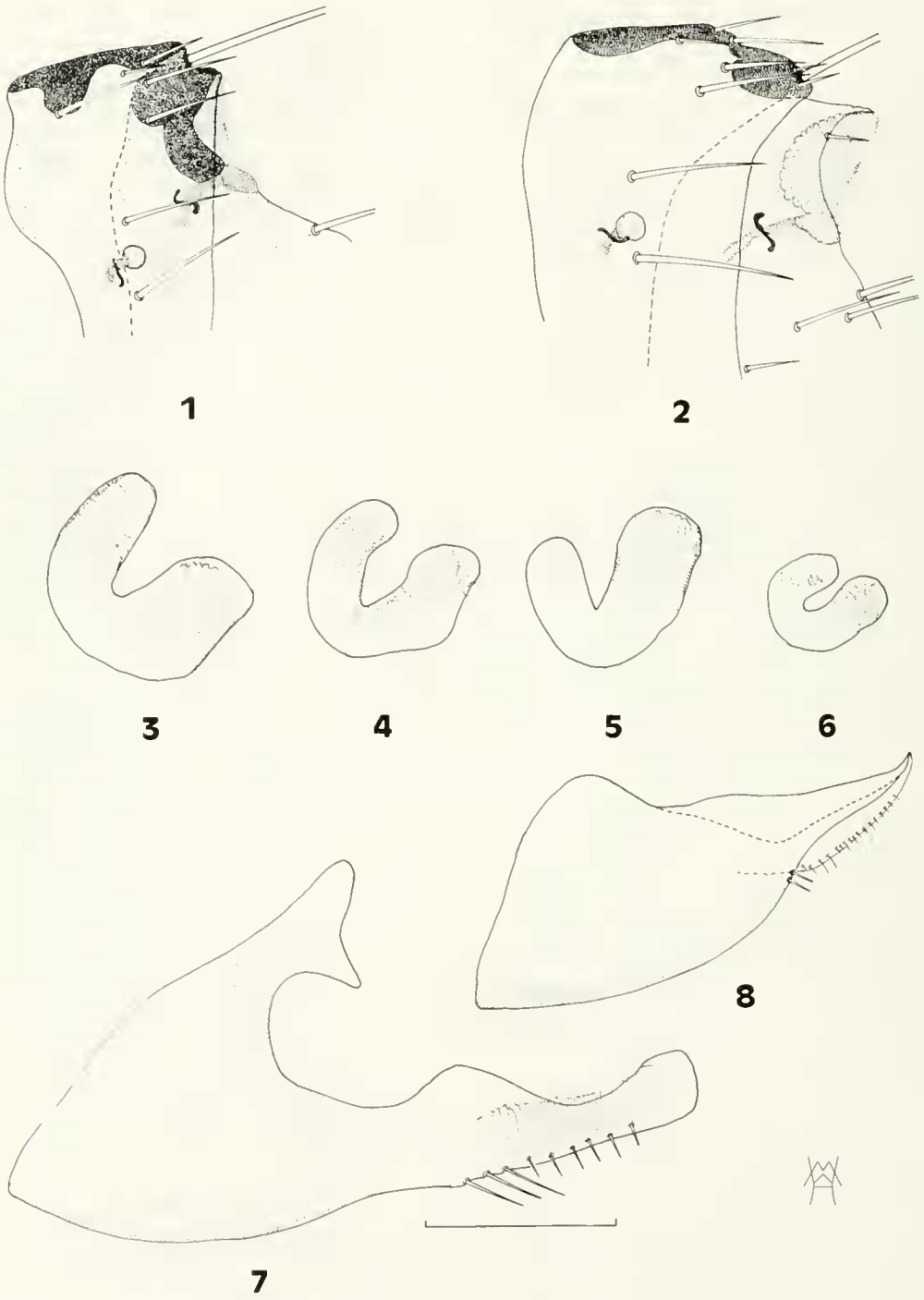
Material examined.—U.S.A., TEXAS: 1 ♂, 1 ♀, ex: *E. perotis*, Big Bend National Park, Brewster Co., 23-VI-1967, D.A. Easterla; 1 ♂, *ibid.*, but 1-VII-1967; VENEZUELA: 1 ♂, 1 ♀, ex: *N. macrotis*, Talud del Cerro Marahuaca, Edo. Amazonas, elev. 1300 m, 21-II-1985, R. Guerrero.

Remarks.—The Venezuela record above is new for that country. This is not surprising, since Venezuela is situated geographically between other known records. Jordan (1950) described *H. trux* from a pair collected from “bats” near sea level in Trujillo City, Peru, and Ayala-Barajas et al. (1988) reported two females from *N. macrotis* at Indio Verdes, Mexico. The most northern record is reported by Whitaker and Easterla (1975) from Big Bend National Park, Brewster County, Texas. They recovered 23

specimens from a single *E. perotis* (among 19 examined) and 2 specimens from *N. macrotis* (among 64 examined). Such large numbers of fleas from a single bat among so many negative bats of the same species, locality, and collection period, would suggest limited exposure to adult fleas. *Eumops perotis*, a very large bat, requires substantial roosting heights (greater than 10 feet) to routinely begin flight (Barbour and Davis 1969). It is highly unlikely that host seeking adult *H. trux* could traverse vertical inclines to such great heights. Consequently, contact with adult fleas might only be possible during the bats infrequent contact with guano. This might provide an explanation of why a single adult became infested with a large numbers of fleas, while others had none at all. If this infestation mechanism is valid, one would expect to collect large numbers of adult *H. trux* from guano deposits during June and July in Texas environs. The altitudinal distribution of *Hormopsylla trux* appears to occur between sea level and 2200 meters wherever *E. perotis* occurs. *Nyctinomops macrotis* may serve in distributing *H. trux* across its range wherever *E. perotis* is located, since *E. perotis* is not considered a migratory species (Nowak and Paradiso 1983).

KEY TO THE KNOWN SPECIES OF
HORMOPSYLLA

- 1. Subdorsal incassation of frons (between frons and cibarium) present 2
- Subdorsal incassation of frons absent 5
- 2. Male 3
- Female 4
- 3. Apex of eighth sternite blunt, with many coarse striae on the mesal surface running perpendicular to the long axis (Fig. 7) *fosteri*
- Apex of eighth sternite acute, without coarse striae on the mesal surface (Fig. 8) *kyriophila*
- 4. Dorsal incassation of tergite 7 much thicker than width of head of spermatheca (Figs. 1, 6); eighth tergite with a heavily sclerotized incassation enveloping the last abdominal spiracle (Fig. 1); metanotal comb with 8–10 teeth *kyriophila*
- Dorsal incassation much thinner than width of head of spermatheca (Figs. 2, 5); eighth tergite with at most, a faint sclerotization enveloping



Figs. 1-8. *Hormopsylla* spp. 1-2, Female, dorsal incassations of abdominal tergites VII and VIII. 1, *H. kyriophila*. 2, *H. fosteri*. 3-6, Spermathecae. 3, *H. egena*. 4, *H. trux*. 5, *H. fosteri*. 6, *H. kyriophila*. 7-8, Eighth sternum. 7, *H. fosteri*. 8, *H. kyriophila*. Scale = 100 μ .

- spiracle (Fig. 2); metanotal comb with 10–12 teeth *fosteri*
- 5. Vertical depth (thickness) of dorsal occipital incassations less than the width of base of second genal tooth; metanotal comb with 20–22 teeth (male unknown) *egena*
- Vertical depth equal to, or distinctly greater than the width of the base of the second genal tooth; metanotal comb with 10–14 teeth *trux*

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